

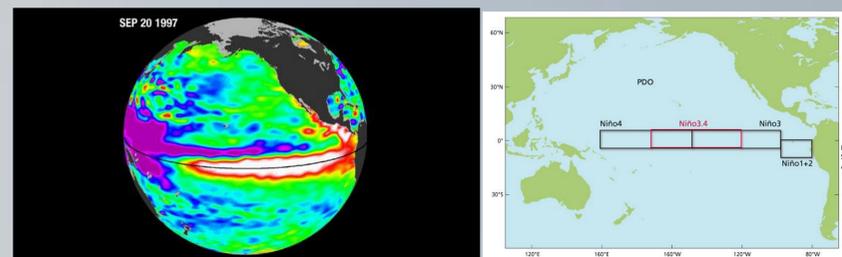
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Context

El Niño is a weather anomaly tied to the warming and cooling of the Pacific Ocean in the space between 5°N to 5°S and 120° to 170°W, also called the El Niño 3.4 region. It is a phase of 'El Niño Southern Oscillation' (ENSO), which refers to variations in the temperature of the surface of the tropical eastern Pacific Ocean and in air surface pressure in the tropical western Pacific. The warm oceanic phase, El Niño, accompanies high air surface pressure in the western Pacific. Mechanisms that cause the oscillation remain under study. Developing countries dependent upon agriculture and fishing, particularly those bordering the Pacific Ocean, are the most affected. El Niño is Spanish for "the boy", and the capitalized term El Niño refers to the Christ child, Jesus, because periodic warming in the Pacific near South America is usually noticed around Christmas. ("El")

Observations: Global

The SSTA went widely unmeasured up until 1870 in which the first sign of a pattern (rises and drops) appeared. Moderate ENSO events have occurred roughly every 2 to 7 years, correlating with SSTA's of +1 degree or more (Null). During the stronger ENSO events ('57-8, '65-6, '72-3, '82-3, '87-8, '97-8), the SSTA is greater than +2 degrees, suggesting a strong correlation between strong ENSO events and SSTA. However, in '91-2 and 2009-10 the SSTA was above the 2 degree threshold without the correlation of a strong ENSO event. There was an event both years, and both times it caused major global climate variations, but each event was still classified as moderate (the two strongest moderates on record). In addition, for every ENSO event, there is a SSTA above the +1 degree threshold, and for every strong ENSO event, there is a SSTA above the +2 degree threshold. This suggests that the correlation is more than ENSO causing the anomaly, rather, as the presence of a Kelvin Wave; the anomaly signifies the beginning of an ENSO event and a forecast of intensity.



(Watts) Figures 4 (left) and 5 (right). Figure 4 shows the sea surface anomalies during the El Niño of 1997, white means warmer than normal water while purple means colder than normal. Figure 5 shows where the region El Niño 3.4 lies.

Observations: Ecuador

Climate in Ecuador varied between 1880-1990, but still stayed in the same range. There is a sharp rise of range from 1978-1982, which is attributed to the second largest ENSO (El Niño-Southern Oscillation) event on record, which occurred during 1982 to 1983. This sharp rise continues on even now, with an even greater rise during the years of 1997 to 1998 due to the Great El Niño (also referred to as The Winter of '97), but continued its relatively constant increase in range with a slow drop in variance after the '97-'98 occurrence to now.

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Precipitation in Ecuador overall has a constant range, with consistent variance. However from 1916 to 1926 the range rises, peaking during the early 20's and dropping down to slightly above the average from 1900-1916. From the mid-20's up until the Winter of '97, the range, as well as the variance, of Ecuadorean precipitation remained fairly consistent. During the '97-'98 ENSO event there is a steep increase, eventually falling back in the early 2000's, in which both the max and min is between 8.5 to 9.0 and -8.5 to -9.0. The temperature recoils from the mid-2000's has several correlations, as the variance is decreasing while the range stayed constant, similar to the temperature.

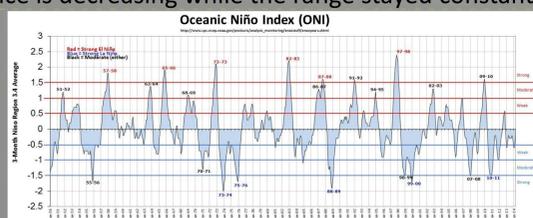


Figure 1; (Null) Sea surface temperature anomalies variances since 1950 in the El Niño 3.4 area.

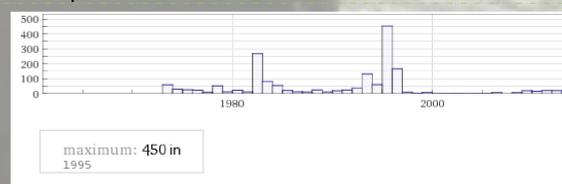


Figure 3; (ENSO) A graph of the recorded precipitation levels in Ecuador, Significant years are 1982 and 1995, both of which are years preceding an ENSO event.

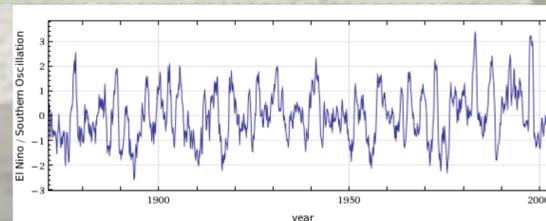


Figure 2; ("ENSO") An extended graph of the SSTA since 1970.

Conclusion

El Niño is a phase of 'El Niño Southern Oscillation' (ENSO), which refers to variations in the temperature of the surface of the tropical eastern Pacific Ocean and in air surface pressure in the tropical western Pacific. ENSO events can cause large variations from climatic norm, before, during and after El Niño events. Moderate ENSO events have occurred roughly every 2 to 7 years, correlating with SSTA's of +1 degree or more (Null). During the stronger ENSO events ('57-8, '65-6, '72-3, '82-3, '87-8, '97-8), the SSTA is greater than +2 degrees, suggesting a strong correlation between strong ENSO events and SSTA. In addition, for every ENSO event, there is a SSTA above the +1 degree threshold, and for every strong ENSO event, there is a SSTA above the +2 degree threshold.

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